

IN THE CLAIMS:

Please amend claims 20, 26-31, 37, 40-42, 44 and 46, and add claims 48 and 49 as follows. For the Examiner's convenience, all pending claims are presented below.

Claims 1-19. (Cancelled).

20. (Currently Amended) An exposure apparatus comprising:  
an optical system, which directs an exposure beam emitted from a light source onto a substrate, said optical system including a casing and an optical element, said casing having a closed space and said optical element being disposed in the closed space;  
a first supplier, which supplies an inert gas into the closed space;  
a second supplier, which supplies ~~one of oxygen and clean air a gas~~  
containing at least oxygen into the closed space;  
a discharger, which discharges the gas from the closed space; and  
a controller for changing a wavelength of the exposure beam between an exposure process for the substrate and a cleaning process for the optical element,  
wherein said controller controls said first supplier and said second supplier.

21. (Previously Added) An apparatus according to Claim 20, wherein said first supplier comprises a first valve, said second supplier comprises a second valve and said controller controls said first valve and said second valve.

22. (Previously Added) An apparatus according to Claim 20, wherein said controller controls a concentration of oxygen in the closed space.

Claims 23-25. (Cancelled).

26. (Currently Amended) An exposure apparatus comprising:

an optical system, which directs an exposure beam emitted from a light source onto a substrate, said optical system including a casing and an optical element, said casing having a closed space and said optical element being disposed in the closed space;

a first supplier, which supplies an inert gas into the closed space;

a second supplier, which supplies ~~one of oxygen and clean air a gas~~  
containing at least oxygen into the closed space;

a discharger, which discharges the gas from the closed space; and

a controller for changing a wavelength of the exposure beam between an exposure process for the substrate and a cleaning process for the optical element, wherein said controller changes the wavelength of the exposure beam into a wavelength region higher than an oxygen absorptivity when said second supplier supplies the oxygen.

27. (Currently Amended) An exposure apparatus comprising:

an optical system, which directs an exposure beam emitted from a light source onto a substrate, said optical system including a casing and an optical element, said casing having a closed space and said optical element being disposed in the closed space;

a first supplier, which supplies an inert gas into the closed space;

a second supplier, which supplies ~~one of oxygen and clean air a gas~~  
containing at least oxygen into the closed space;

a discharger, which discharges the gas from the closed space; and

a controller for changing a wavelength of the exposure beam between an exposure process for the substrate and a cleaning process for the optical element, wherein said controller changes the wavelength of the exposure beam to a shorter wavelength when said second supplier supplies the oxygen.

28. (Currently Amended) An exposure apparatus comprising:

an optical system, which directs an exposure beam emitted from a light source onto a substrate, said optical system including a casing and an optical element, said casing having a closed space and said optical element being disposed in the closed space;

a first supplier, which supplies an inert gas into the closed space;

a second supplier, which supplies ~~one of oxygen and clean air a gas~~  
containing at least oxygen into the closed space;

a discharger, which discharges the gas from the closed space;

a controller for changing a wavelength of the exposure beam between an exposure process for the substrate and a cleaning process for the optical element; and

a laser control device which changes the emission laser wavelength region, wherein said controller controls said laser control device.

29. (Currently Amended) An exposure apparatus comprising:

an optical system, which directs an exposure beam emitted from a light source onto a substrate, said optical system including a casing and an optical element, said casing having a closed space and said optical element being disposed in the closed space;

a first supplier, which supplies an inert gas into the closed space;

a second supplier, which supplies ~~one of oxygen and clean air a gas~~  
containing at least oxygen into the closed space;

a discharger, which discharges the gas from the closed space; and

a controller for changing a wavelength of the exposure beam between an exposure process for the substrate and a cleaning process for the optical element, wherein said controller oscillates the wavelength region continuously.

30. (Currently Amended) An exposure apparatus comprising:

an optical system, which directs an exposure beam emitted from a light source onto a substrate, said optical system including a casing and an optical element, said casing having a closed space and said optical element being disposed in the closed space;

a first supplier, which supplies an inert gas into the closed space;

a second supplier, which supplies ~~one of oxygen and clean air a gas~~  
containing at least oxygen into the closed space;

a discharger, which discharges the gas from the closed space; and

a controller for changing a wavelength of the exposure beam between an exposure process for the substrate and a cleaning process for the optical element, wherein said controller controls actuation of said light source.

31. (Currently Amended) An exposure apparatus comprising:

an optical system, which directs an exposure beam emitted from a light source onto a substrate, said optical system including a casing and an optical element, said casing having a closed space and said optical element being disposed in the closed space;

a first supplier, which supplies an inert gas into the closed space;

a second supplier, which supplies ~~one of oxygen and clean air~~ a gas containing at least oxygen into the closed space;

a discharger, which discharges the gas from the closed space; and

a controller for changing a wavelength of the exposure beam between an exposure process for the substrate and a cleaning process for the optical element, wherein said controller inserts a wavelength changing element into a path of the exposure beam.

32. (Previously Added) An apparatus according to Claim 31, wherein said wavelength changing element is a harmonic wave producing element.

Claims 33-36. (Cancelled).

37. (Currently Amended) A device manufacturing method comprising the steps of:

providing an exposure apparatus comprising:

(i) an optical system, which directs an exposure beam emitted from a light source onto a substrate, said optical system including a casing and an optical

element, said casing having a closed space and said optical element being disposed in the closed space,

(ii) a first supplier, which supplies an inert gas into the closed space,

(iii) a second supplier, which supplies ~~one of oxygen and clean air a gas~~  
containing at least oxygen into the closed space,

(iv) a discharger, which discharges the gas from the closed space, and

(v) a controller for changing a wavelength of the exposure beam

between an exposure process for the substrate and a cleaning process for the optical element;

exposing a substrate by use of the exposure apparatus; and

developing the exposed substrate.

Claims 38 and 39. (Cancelled).

40. (Currently Amended) An exposure apparatus comprising:

an optical system, which directs an exposure beam emitted from a light source onto a substrate, said optical system including a casing and an optical element, said casing having a closed space and said optical element being disposed in the closed space;

a first supplier, which supplies an inert gas into the closed space;

a second supplier, which supplies ~~one of oxygen and clean air a gas~~  
containing at least oxygen into the closed space; and

a controller, which controls concentration of oxygen in the closed space,

wherein said controller functions so that, before exposure of the substrate, the inside of the closed space is filled with substantially only the inert gas.

41. (Currently Amended) A device manufacturing method, comprising the steps of:

providing an exposure apparatus comprising:

(i) an optical system, which directs an exposure beam emitted from a light source onto a substrate, said optical system including a casing and an optical element, said casing having a closed space and said optical element being disposed in the closed space,

(ii) a first supplier, which supplies an inert gas into the closed space,

(iii) a second supplier, which supplies ~~one of oxygen and clean air a gas~~ containing at least oxygen into the closed space, and

(iv) a controller, which controls concentration of oxygen in the closed space;

exposing a substrate by use of the exposure apparatus; and

developing the exposed substrate.

42. (Currently Amended) An exposure apparatus, comprising:

an optical system, which directs an exposure beam emitted from a light source onto a substrate, said optical system including a casing and an optical element, said casing having a closed space and said optical element being disposed in the closed space;

a first supplier, which supplies an inert gas into the closed space and the ~~optical system casing~~; and

a second supplier, which supplies ~~one of oxygen and clean air a gas~~ containing at least oxygen into the closed space.

43. (Previously Added) An apparatus according to Claim 42, further comprising a discharger, which discharges the gas from the closed space.

44. (Currently Amended) An apparatus according to Claim 42, wherein, in a state in which ~~a gas that contains~~ the gas containing at least oxygen is introduced in the closed space by said second supplier, the beam is projected to thereby clean the optical element.

45. (Previously Added) A device manufacturing method, comprising the steps of:

providing an exposure apparatus as recited in Claim 42;

exposing a substrate by use of the exposure apparatus; and

developing the exposed substrate.

46. (Currently Amended) An exposure apparatus, comprising:  
an optical system, which directs an exposure beam emitted from a light source onto a substrate, said optical system including a casing and an optical element, said casing having a closed space and said optical element being disposed in the closed space;  
a first supplier, which supplies an inert gas into the closed space; and

a second supplier, which supplies ~~one of oxygen and clean air a gas~~  
containing at least oxygen into the closed space,

wherein, in a state in which ~~a gas that contains the gas containing at least~~ oxygen is introduced into the closed space by said second supplier, the beam is projected to thereby clean the optical element.

47. (Previously Added) A device manufacturing method, comprising the steps of:

providing an exposure apparatus as recited in Claim 46;  
exposing a substrate by use of the exposure apparatus; and  
developing the exposed substrate.

48. (New) An exposure apparatus comprising:

an optical system, which directs an exposure beam emitted from a light source onto a substrate, said optical system including a casing and an optical element, said casing having a closed space and said optical element being disposed in the closed space;  
a first supplier, which supplies an inert gas into the closed space;  
a second supplier, which supplies a gas containing at least oxygen into the closed space; and

a controller, which controls the first supplier and the second supplier,  
wherein said controller functions so that, before exposure of the substrate, the inside of the closed space is filled with substantially only the inert gas.

49. (New) A device manufacturing method, comprising the steps of:

providing an exposure apparatus comprising:

(i) an optical system, which directs an exposure beam emitted from a light source onto a substrate, said optical system including a casing and an optical element, said casing having a closed space and said optical element being disposed in the closed space,

(ii) a first supplier, which supplies an inert gas into the closed space,

(iii) a second supplier, which supplies a gas containing at least oxygen into the closed space, and

(iv) a controller, which controls the first supplier and the second supplier;

exposing a substrate by use of the exposure apparatus; and

developing the exposed substrate.

REMARKS

Applicants request favorable consideration and allowance of the subject application in view of the preceding amendments and the following remarks.

Claims 20-22, 26-32, 37 and 40-49 are presented for consideration. Claims 20, 26-31, 37, 40-42, 46, 48 and 49 are independent. Claims 20, 26-31, 37, 40-42, 44 and 46 have been amended to clarify features of the invention, and claims 48 and 49 have been added to provide an additional scope of protection. Support for these changes and claims can be found in the original application, as filed. Therefore, no new matter has been added.

Claims 20-22, 26-32, 37 and 40-47 were previously allowed in this application. Applicants submit that the foregoing changes do not affect the allowability of these claims. Therefore, these claims should remain allowable. In addition to these claims being allowable, Applicants submit that independent claims 48 and 49 patentably define features of the exposure apparatus and the device manufacturing method of the present invention. Accordingly, these claims likewise should be allowable.

Applicants submit, therefore, that the instant application is in condition for allowance. Favorable consideration and an early Notice of Allowance are requested.

Applicants' undersigned attorney may be reached in our Washington, D.C. office by telephone at (202) 530-1010. All correspondence should continue to be directed to our below-listed address.

Respectfully submitted,

  
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